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Jo Anne Kipps
Fresno, CA

Patrick Pulupa, Executive Officer
Central Valley Water Quality Control Board

Via email to: Stacy.Gotham@waterboards.ca.gov

Tentative WDRs Order & NPDES Permit (CA0079081) for City of Chico's Water Pollution Control Plant

This letter transmits my comments on the subject Tentative Waste Discharge Requirements (WDRs) Order and NPDES Permit renewal (hereafter tentative permit). The tentative permit proposes to rescind and replace existing WDRs Order R5-2016-0023 for the City of Chico (City), Water Pollution Control Plant (Facility) in Butte County.

I am a resident of Fresno County California and, for 30 years and counting, a registered civil engineer. From 1998 to 2010, I worked in the Central Valley Water Board's Fresno office in the NPDES Program and the WDR Program, mostly the later. The experience I gained in writing NPDES permits gave me a lasting appreciation and respect for NPDES staff. They must learn and then administer an exhaustive suite of federal laws, regulations, rules, and policies to prepare, every five years, tentative NPDES permit renewals for the region's surface water dischargers.

Preamble. If a surface water discharging facility includes a land discharge, as it does in the tentative permit, then the WDRs Order / NPDES Permit must prescribe terms and conditions that implement a separate suite of state laws, regulations, rules, and policies. Chief among these in most land discharge situations are the region's two Basin Plans and the state Antidegradation Policy. Basin Plans establish numerical and narrative water quality objectives necessary to protect the designated beneficial uses of each Basin's waters. The Antidegradation Policy requires discharges of waste to high quality water to maintain that existing high quality "until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of that water, and will not result in water quality less than that of prescribed policies" (Resolution 68-16).

In addition to monitoring the quantity and quality of wastewater discharged to the surface water, NPDES dischargers monitor the receiving water at compliance points upstream and downstream of the discharge. So, typically they monitor just three points for routine compliance purposes. In contrast, land discharges may encompass a few acres (e.g., sludge drying beds), tens of acres (e.g., effluent percolation ponds), or hundreds of acres (e.g., municipal recycled water use areas, winery wastewater land application areas).

Sine land discharges have no rivers to flush discharged waste constituents away, they rely on the vadose zone to decompose and attenuate applied waste such as nitrogen and BOD. To be effective and protective of groundwater, soil treatment requires sufficient area and

vadose zone depth to treat the mass of applied waste constituents. Water quality concerns aside, the least costly way of discharging waste constituents to land is to use the smallest area possible. If the area is too small, however, the loading of nitrogen and BOD may overwhelm the soil's ability to rapidly decompose the applied waste, resulting in anoxic conditions in the vadose zone and even in underlying groundwater. While such conditions do enhance denitrification, they also decrease the rate at which BOD decomposes and ammonia nitrifies. They also can also solubilize metals that naturally occur in the soil, including iron, manganese, and arsenic. Indeed, non-detect or low concentrations in affected groundwater of nitrate, compared to background, and elevated concentrations of dissolved manganese, iron and arsenic, have long been recognized as de facto indicators of excessive organic loading.[1]

Because of the risk to groundwater from land discharges of waste containing nitrogen and BOD, most WDRs for discharges to "land application areas" prescribe loading limits for nitrogen and BOD. Annual nitrogen loadings are typically limited to nitrogen uptake rates by plants grown on and harvested from the disposal area. Daily BOD loadings are assumed to be sufficiently conservative to prevent chronic anoxic conditions in the vadose zone. The Board has historically regulated discharges to percolation ponds of secondary treated municipal wastewater without considering their nitrogen and BOD loadings to the soils underlying the percolation ponds. Instead, the Board has typically established effluent limitations for pond discharges for at least BOD and TSS that are reflective of secondary treatment of municipal wastewater.

But, what if these limitations still overload the vadose zone with BOD and nitrogen? The oxygen transfer rate in air, expressed as the oxygen diffusion coefficient, is about 5,000 to 10,000 times greater than in water. Long-term impoundment of effluent deprives the soil of atmospheric oxygen and, depending on the BOD loading, resulting in chronic anoxic conditions in the vadose zone, causing groundwater to contain manganese, iron, and possibly arsenic in concentrations exceeding water quality objectives (i.e., drinking water maximum contaminant levels, MCLs). This is the situation in groundwater affected by the City's discharge of secondary treated effluent to unlined ponds.

Compared to most land discharge WDRs, the tentative permit is distressingly brief when it comes to the discharge's affect on groundwater and its consistency with the Antidegradation Policy. Most land discharge WDRs characterize the discharge, for starters, and its affect on underlying groundwater, both existing and potential. They also evaluate the discharge's consistency with the Antidegradation Policy on a constituent-by-constituent basis, typically focusing on constituents with applicable water quality objectives. They often assess the ability of the vadose zone to attenuate constituents to levels that do not cause or contribute to exceedances of groundwater limitations.

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[1] See Board meeting Information Items dated 28 January 2005 and 17 March 2016 regarding Regulation of Food Processing Waste to Land (https://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_land/#foodprocessing)

Additionally, most land discharge WDRs assess whether the discharge is conducted in a manner that, at a minimum, reflects best practicable treatment or control (BPTC) to ensure it does not cause (or contribute to cause) the groundwater to contain applied waste constituents (or their decomposition byproducts) in concentrations exceeding applicable water quality objectives. The nitty-gritty work of this assessment entails summarizing and analyzing monitoring data for the discharge and, where available, for groundwater passing through wells comprising the discharger's groundwater monitoring well network.

In short, there is a lot going on with a land discharge. It's understandable that, due to chronic understaffing and resource shortages, NPDES staff may be limited to performing only cursory evaluations of land discharge(s) for consistency with the Basin Plan and Antidegradation Policy. The tentative permit appears to be a casualty of the Board's chronic underfunding.

The tentative permit does not characterize the groundwater affected by the pond discharge, let alone the discharge itself. Further, it does not recognize the work performed by the City, as required by the current permit, to install a groundwater monitoring well network, characterize groundwater quality, assess the discharge's impact on groundwater, and evaluate the Facility and its discharges to land for consistency with the State Antidegradation Policy (Resolution 68-16).[2] It also does not mention the City's proposal for specific Facility improvements to enhance the discharge's consistency with the Antidegradation Policy.[3] These proposed improvements would include lining an emergency wastewater storage pond, adding treatment to reduce effluent nitrate, and assessing and improving the Facility's sludge drying beds.

In short, the tentative permit does not prescribe effective terms and conditions to ensure that the Facility's ongoing discharges do not continue to pollute and unreasonably degrade groundwater. It does not require the City to construct Facility improvements necessary to ensure its ongoing discharges will not contribute to an existing condition of groundwater pollution and unreasonable degradation. Without significant improvements (e.g., implementing denitrification), the City therefore will continue to discharge waste in a manner that causes violations of groundwater limitations in violation of the current permit and, once adopted, the tentative permit.

The changes necessary for the tentative permit to correct these deficiencies are substantive and, as such, should warrant another round of public review and comment.

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[2] Technical Report GROUNDWATER QUALITY CHARACTERIZATION AND ANTIDEGRADATION REEVALUATION for the City of Chico Water Pollution Control Plant, dated April 2020, issued by Carollo (hereafter April 2020 Report).

[3] Technical Memorandum POND/FACILITY IMPROVEMENT OPTIONS for the City of Chico Water Pollution Control Plant, dated August 2019, issued by Carollo (hereafter August 2019 Report)

Recommendation 1: Revise the tentative permit to adequately address the City's land discharges in a manner similar to WDRs for land discharges. This includes characterizing the discharges and their impacts on groundwater, as well as evaluating them on a constituent-by-constituent basis for consistency with the Basin Plan and Antidegradation Policy. Re-circulate the revised tentative permit for public review and comment.

The current permit failed to protect groundwater five years ago, and the tentative permit proposes to do the same. In the event that you will dismiss my recommendation for extensive permit revision and re-circulation, I offer the following specific recommendations for improving the tentative permit.

***Permitted Discharge Flow*.** The Facility features two wastewater treatment plants (Plants 1 and 2). The existing permit establishes mass loading limits for BOD and TSS based on a treatment capacity of 12-MGD average design dry weather flow (ADWF). The tentative permit replaces the current permit's BOD & TSS mass loading limits by prohibiting discharge flows exceeding 12 MGD. This is reasonable. However, Plant 1 is useless without major rehabilitation. Until the City commits to this work, the tentative permit should prohibit discharges in excess of Plant 2's treatment capacity at ADWF. If, during permit negotiations, the City commits to completing this work during this permit cycle, the prohibition may be further revised to allow for discharge flows to increase back up to 12 MGD following City certification of work completion (a special provision requirement).

Recommendation 2. Identify Plant 2's design treatment capacity, expressed in terms of MGD at ADWF, and revise Discharge Prohibition III.E to prohibit discharges exceeding this flow.

Land Discharges. The City's land discharges include leachate and contaminated storm water from the Facility's sludge drying beds and biosolids stockpile areas and seepage of raw sewage from an unlined, seldom-used emergency storage pond (PND-004). This pond, located near the sludge drying beds, is reportedly equipped to return the bypassed flow to the headworks. When dry, the City used to stockpile biosolids in this pond, but has since ceased this practice. With respect to sheer volume, the most significant land discharge is the City's ongoing discharge of secondary treated municipal effluent to unlined ponds (PND-001, PND-002, and PND-003).

The City's land discharges may also include Facility storm water. The tentative permit's ATTACHMENT C – FLOW SCHEMATIC shows Plant storm water discharging to a wet well that also receives Plant effluent flow. From this wet well, the STORMWATER PUMP STATION discharges the combined flow to JUNCTION BOX NO. 1, from which flow can be routed to either the river outfall or to the wetlands. The tentative permit's Fact Sheet, on Page F-7, states, "All storm water at the Facility is captured and directed to the Facility headworks for treatment and disposal under this Order. Therefore, coverage under the General Storm Water Permit is not required." This declaration appears to contradict the information in the Facility's flow schematic.

Recommendation 3. Review the Facility's flow schematic for storm water flows and confer with the City to confirm its current Facility storm water collection, treatment, and disposal practices. As necessary, revise the tentative permit to reflect the Facility's current storm water management operations.

Sludge Discharges. Discharges of leachate from sludge drying beds are often responsible for causing "unreasonable" groundwater degradation, unreasonable because these facilities can be designed and maintained in a manner that precludes the release of leachate.

The City's seven-acre sludge drying area is reportedly self-contained on a concrete slab and equipped to route sludge centrate and any contaminated storm water back to the primary treatment process. The legend in the tentative permit's ATTACHMENT C – FLOW SCHEMATIC includes SLUDGE BED UNDERFLOW. I am unable to locate this on the flow schematic. Perhaps it refers to the flow of sludge centrate and contaminated storm water. In any event, the only process stream shown that is routed back to the primary treatment (INFLUENT CHANNEL) is the supernatant from the gravity thickener. The flow schematic does not identify the Facility's sludge digesters or the digester supernatant process flow.

Recommendation 4: Describe the Facility's sludge drying bed containment and confirm whether the beds are equipped with leachate collection. Confirm that the Facility's flow schematic reflects its current and complete operation with respect to sludge and supernatant process flows. Confirm that all sludge digester supernatant is routed back to the primary treatment works. Revise the tentative permit accordingly or at least include this information in the response to comments.

As mentioned, discharges of leachate from sludge drying and biosolids stockpile areas pose a high risk to groundwater. The City initiated groundwater monitoring in late 2017. Unsurprisingly, groundwater passing through the monitoring well closest to the sludge drying beds (GW-2) contains nitrate and manganese in concentrations well in excess of the MCLs. In 2018, the City ceased drying sludge, but still uses the drying beds "as necessary during maintenance" (F-7). It has also committed itself to cease stockpiling in the Facility's unlined emergency wastewater storage pond (PND-004).

To ensure the City's commitment to cease onsite biosolids stockpiling, the tentative permit should prohibit this practice until the City certifies that it has equipped designated biosolids stockpile areas with containment sufficient to comply with groundwater limitations.

Recommendation 5. Revise the tentative permit to prohibit onsite storage of biosolids and other waste solids (e.g., grit) until the City submits certification that its Facility's biosolids and waste solids storage operations comply with section IV.B.1.c,"No waste constituent shall be released, discharged, or placed where it will cause a violation of the Groundwater Limitations of this Order." Include a special provision to identify the work and work products required by this certification.

While the City plans to dewater sludge in the drying beds only when necessary for maintenance purposes, these future discharges will likely continue adversely impacting groundwater. The tentative permit should describe the sludge drying bed area's

containment. It should require the City to assess the integrity of this area's containment *before* resuming sludge discharges, however infrequently and short-lived. To this end, the tentative permit should require the City to submit a technical report that describes this assessment, identifies work necessary to preclude the release to soil of leachate and contaminated storm water, and proposes a work plan and implementation schedule. The tasks required by a special provision should incorporate work already proposed by the City in the August 2019 Report, including:

- Confirmation that all storm water is directed to the headworks.
- Visual inspection of "bird baths" or areas of water ponding after a significant rain event.
- Investigation of imperviousness of concrete at the sludge drying area.

Recommendation 6. Revise the tentative permit to prohibit discharges of sludge and other solids (e.g., grit) to the sludge drying beds until the City certifies it has rehabilitated the sludge drying bed area in a manner that assures future sludge discharges will comply with section IV.B.1.c. Include a special provision to identify the work and work products required by this certification.

M&T Pond and Wetlands Discharges. The City discharges most of the Facility's effluent to the Sacramento River at Discharge Point D-001, the City's outfall. It also occasionally discharges effluent to land at Discharge Point D-002, the Facility's 2.2-acre M&T Pond (PND-001). Effluent impounded in the M&T Pond gravity flows to 30-acre constructed wetlands known as the Southeast Pond (PND-002) and the Southwest Pond (PND-003). Little Chico Creek and, if unlined, the M&T Irrigation Canal, are sources of high quality surface water that recharge groundwater immediately adjacent to the M&T Pond and constructed wetlands.

The constructed wetlands feature multiple deeper internal ponds, visible on Google Earth historic imagery, especially 5/2/2021. The Southeast Pond has a single 13-acre internal pond. The Southwest Pond has three similarly sized ponds totaling about 18 acres. From Carollo's April 2010 report:

> Together, these final disposal ponds serve as constructed wetlands through intermittent discharge of treated effluent from the WPCP on an as-needed basis. The City also utilizes Discharge Point D-002 for the discharge of treated effluent during facility upset conditions, thus protecting water quality at the surface water discharge to the Sacramento River. [Page 1]

Historic images of the City's wetlands available on Google Earth invariably show water in the M&T Pond and the wetlands' internal ponds. Some show the wetlands completely inundated. Many show algae flourishing in impounded effluent (i.e., the ponds are varying vivid shades of algae green). Several show what appear to be algae blooms (e.g., 5/17/2018). While algae pumps oxygen into the water during the day, thereby providing additional BOD removal, when algae bloom and die and land on pond bottom soils they deposit an organically-rich sludge layer that exerts a BOD load to soil above and beyond that attributable to the effluent discharge.

For decades and without Board authorization, the City discharged effluent to the M&T Pond and two constructed wetlands. Staff was apparently aware of the City's practice to "divert 'off-spec' water to the ponds"[4] and only introduced land discharge specifications in the City's NPDES Permit for the first time in 2016 (the current permit).

The current permit recognized the potential for D-002 discharges to degrade groundwater due to the elevated effluent nitrate concentrations (average 22 mg/L as N) "because there is little ability for attenuation in the shallow permeable vadose zone beneath the Facility" (Fact Sheet F-48). It established groundwater limitations, including MCLs and a narrative limitation for taste and odor. It also prescribed discharge specifications for D-002, including new effluent quality and flow limitations. It stipulates that, "No waste constituent shall be released, discharged, or placed where it will cause a violation of the Groundwater Limitations of this Order." And, it requires the City to "operate all systems and equipment to optimize the quality of the discharge." The tentative permit carries over these land discharge specifications.

The effluent limitations set for D-002 are for BOD and TSS (Total Suspended Solids), pH, and Total Coliform Organisms (TCO). They also require 85 percent removal of influent BOD and TSS. The 30 mg/L average monthly and 45 mg/L average weekly limits for BOD and TSS and the 85 percent BOD/TSS removal requirement for D-002 are same as for D-001, the City's discharge to the Sacramento River.

The current permit posits these effluent limitations for D-002 as reflective of BPTC and, as such, the land discharge authorized by the WDRs is consistent with the Antidegradation Policy. On its face this appears reasonable, as there was no discharge-specific groundwater data available in 2016 indicating there was a problem. Apparently, in response to the City's concern that it may not be able to consistently comply with the new effluent limitations for D-002, the current permit postpones compliance with section IV.B.1.a-b until the day before the permit expires. This authorized delay amounts to a financial windfall for the City, which "has one of the lowest sewer rates in the region."[5]

The current permit suspends the requirement to monitor D-002 for BOD, TSS, TCO, pH, and Percent BOD/TSS removal until after the City "has constructed improvements necessary" to achieve and maintain compliance with the effluent limitations. Whether by accident or design, this suspension resulted in no data collected on effluent quality since 2016.

The current permit did not provide a technical justification for the 2.5 MGD average monthly flow limit for D-002. But, it did require continuous monitoring of D-002 flow and reporting of this flow in monthly electronic self-monitoring reports (ESMRs).

Monthly ESMRs for January 2021 through March 2022 contain no D-002 flow data. This suggests the City did not discharge *any* effluent to ponds during that period. However, on 79 days, the City *did* discharge the Facility's "full or partial effluent flow" to ponds, according

[4] Meeting Point #5 in MEETING MINUTES for a 2 October 2019 meeting between the City, Carollo engineers, and Board staff, contained in the April 2020 Report.
[5] Meeting Point #15 in MEETING MINUTES for a 2 October 2019 meeting between the City, Carollo engineers, and Board staff, contained in the April 2020 Report.

to comments in daily entries of D-001 total chlorine residual data. The tentative permit does not mention the City' failure to report D-002 flows (at least from January 2021 through March 2022). It is likely therefore that D-002 flow data is missing from earlier ESMRs.

Recommendation 7: Confirm the City's apparent chronic failure to report D-002 flows during the permit period and update, as appropriate, the tentative permit's Compliance Summary (Fact Sheet D) to reflect this violation of monitoring and reporting requirements.

The attached table presents Facility influent and effluent flow data for 79 days from 6 January 2021 to 24 February 2022 on which the City reported discharging to ponds. On the 21 days of full flow to ponds, effluent flow data are missing from ESMRs and influent flows average 6 MGD and total 127 MGD. On the 58 days of partial flow to ponds, the difference between daily influent and effluent flows average 2.4 MGD and total 136 MG. If daily pond discharge flow equals (1) influent flow on the days of full effluent flow to ponds or (2) the difference between influent and effluent flows on days of partial effluent flow to ponds, then the City discharged a total of 263 MG to ponds on 79 days during the 395-day ESMR review period. It is helpful to translate that information into annual hydraulic load. Assuming the wetted area routinely receiving D-002 flow is comprised of PND-001, PND-002's 13-acre internal pond, and PND-003's 18 acres of internal ponds, then the combined wetted area is roughly 33 acres. The discharge of 263 MG over the 395-day review period to the 33-acre wetted area yields a hydraulic loading of 23 feet/year.

Regarding pond observation monitoring data, both the current and the tentative permits require the City to "install and maintain in each pond a permanent staff gauge with calibration marks that clearly show the water level at design capacity and enable determination of available operational freeboard." Both permits require the City to monitor pond freeboard weekly and report the results in feet *and* inches. I reviewed several of the City's pond monitoring reports and found freeboard consistently reported as greater than four feet. It may be that all three ponds do not have staff gauges to accurately monitor freeboard to the required precision.

Recommendation 8: Confirm that the City has installed permanent pond staff gauges as specified in section VI.C.4.a.x. If necessary, request the City to install these gauges and submit certification that it has completed the work.

Existing Groundwater Impacts. Since 2017, the City has monitored groundwater in seven shallow wells upgradient and downgradient of the Facility and ponds. In brief, the City's "as-needed" discharge to its constructed wetlands has created a 15-foot-high mound of effluent-dominated groundwater under the M&T Pond (GW-4). Evidence that waste constituents in the City's pond discharge, or created by the discharge, are causing anoxic conditions in the mounded groundwater include elevated levels of dissolved manganese (over 20 times the MCL) and dissolved iron (over 4 times the MCL). Additional evidence for anoxic conditions includes nitrate levels much lower than background and detectable or even elevated levels of ammonia.

The April 2020 Report characterizing groundwater recognizes the anoxic conditions in groundwater under the M&T Pond, but opines that the effluent discharge is not responsible

for groundwater containing elevated manganese and iron because effluent concentrations of these metals (as Total Recoverable, yet) are substantially lower than the MCLs. This reasoning discounts the anoxic conditions created by the organic loading to the ponds from the effluent discharge itself and created by the discharge (recall algae pond muck). It suggests that the report's authors are not adequately familiar with the complexities of soil treatment and, as such, are not qualified to render this technical opinion.

The April 2020 Report also opines, essentially, that the higher-than-MCL concentrations of manganese in groundwater under the M&T Pond does not threaten groundwater's beneficial use for municipal supply because there are no municipal wells in the discharge area. This is wrong on so many levels. The current groundwater monitoring well network is inadequate to delineate the vertical and horizontal extent of manganese pollution in groundwater caused by the Facility's land discharges. Regional groundwater flows southwest towards the Sacramento River about two miles away. The decay of riparian vegetation growth exerts its own organic loading to groundwater. This loading may cause chronic anoxic conditions in groundwater that, in turn, cause manganese concentrations to exceed the MCL. Effluent-dominated groundwater flows from the City's property towards the river. There is likely little to no assimilative capacity in downgradient groundwater for additional manganese.

The April 2020 Report notes that the anoxic conditions in groundwater below the M&T Pond are also reducing nitrate levels to below the MCL. It dismisses the elevated ammonia levels in groundwater, often over 10 mg/L, because the Basin Plan does not prescribe a numerical water quality objective for ammonia. However, the current permit does prescribe a narrative groundwater limitation for taste and odor. The European Union has apparently established a limit in drinking water of 0.5 mg/L for ammonium (NH_4).[6] To ensure compliance with the tentative permit's narrative taste and odor groundwater limitation, the tentative permit should translate this narrative limit into a numerical limit of 0.5 mg/L for ammonium (NH_4).

Recommendation 9: Revise the tentative permit to include a numerical groundwater limitation of 0.5 mg/L for ammonium (NH_4). Support this limitation by applying the translation methods contained in internal and external technical guidance documents.

TCO rarely occurs in groundwater passing through the City's background wells, and the April 2020 Report dismisses chronic TCO hits in wells encircling the City's property as a well contamination issue. Recent well disinfection succeeded in reducing TCO in GW-3 near PND-004 and GW-5 near PND-002, but TCO continues to exceed 2.2 MPN/100 mL in GW-4 near PND-001, as well as in GW-2 near the sludge drying beds. This evidence should have prompted staff to assess the adequacy of the vertical separation distance between first-encountered groundwater in GW-4 and the invert elevation of PND-001. Google Earth shows the invert of this pond as being about 136 feet above mean sea level, or almost 5.5 feet above the reference elevation for GW-4. Groundwater elevation data for GW-4 from 2017 to

[6] EU's drinking water standards Council Directive 98/83/EC on the quality of water intended for human consumption. Adopted by the Council, on 3 November 1998.

2022 shows the vertical separation distance to the pond bottom is often less than five feet. Unsaturated soil is a great pathogen filter, provided there is sufficient depth. A requirement for a minimum vertical separation distance between pond invert and first-encountered groundwater may lessen the occurrence of TCO in affected groundwater.

Current evidence of groundwater pollution and unreasonable degradation caused the discharge to the M&T Pond and two wetlands is sufficient for the tentative permit to include a requirement for the City to line the M&T Pond. Values for total nitrogen in GW-4 routinely exceed 10 mg/L and have been as high as 39 mg/L. Because of denitrification, most of the total nitrogen is in the form of ammonia that, through biological nitrification, eventually is transformed to nitrate provided sufficient oxygen is available in the soil. Background nitrate already exceeds the MCL by two to five times. There is thus no remaining assimilative capacity for nitrate in regional groundwater.

Recommendation 10: Revise the tentative permit as follows.

a) *Revise the tentative permit's Fact Sheet to identify the pond invert elevations of all ponds.*

b) *Restrict effluent discharges to PND-001 for wetlands maintenance when there is less than five vertical feet distance separating the invert of PND-001 and first-encountered groundwater in GW-4.*

c) *Include a requirement and compliance schedule for equipping PND-001 with a liner that meets a hydraulic conductivity standard comparable to the State's General Winery Order ($1x10^{-6}$ cm/sec).*

d) *Prescribe for D-002 a new effluent limitation of 10 mg/L total nitrogen to reduce the discharge's organic and nitrogen loading to soil and groundwater. Include special provision describing the work and work products associated with this requirement, along with a compliance schedule.*

Recommendation 11: To adequately characterize the discharge to the M&T Pond and wetlands and its impact on groundwater, as well as to assess the effectiveness of the City's salinity control measures, revise the MRP as follows:

a) *Add to Land Discharge Monitoring Requirements for D-002:*

    i) *Weekly monitoring for EC and nitrogen compounds (nitrate-nitrogen, ammonia, Total Kjeldahl Nitrogen).*

    ii) *Monthly monitoring for TDS and FDS.*

    iii) *Monthly monitoring for Trihalomethanes (THMs) because the City uses chlorine for disinfection and therefore there is reasonable potential for disinfected effluent to contain THMs in concentrations exceeding the MCLs.*

    iv) *Semi-annual monitoring for Standard Minerals*

b) *Add to the suite of constituents monitoring quarterly in compliance and background wells:*

   i) *Total Organic Carbon*

   ii) *Dissolved iron, dissolved manganese, and dissolved arsenic*

   iii) *Hardness and alkalinity*

   iv) *THMs*

c) *Reinstate the current permit's monitoring of the City's supply water. The current permit justified this as required "to evaluate the source of constituents in the wastewater." This data is essential for assessing the City's salinity control efforts*

Recommendation 12: Revise the tentative permit further as follows.

a) *For consistency between permits, arrange groundwater limitations in the same order as the current permit.*

b) *Provide context in the Fact Sheet for section VI.C.1.i. regarding the City's past discharge to the M&T Irrigation Canal, in a manner similar to the current permit.*

c) *Revise Table F-2, Historic Effluent Limitations, to*

   i) *Identify the time period associated with the "representative data," similar to the current permit*

   ii) *Delete MDEL 90 for BOD and TSS as the current permit does prescribe these.*

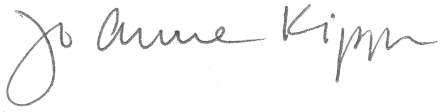
d) *Correct the units for nitrate plus nitrite in the Fact Sheet, Page 7, section (c)*

e) *Combine sections B.2.a-b of the MRP for pond monitoring, as they are similar.*

Closing. Over the years, I have submitted comment letters on many tentative WDRs for food processors and wineries. I often describe adverse impacts to groundwater passing under existing land application areas (LAAs) resulting from Board-prescribed loadings for BOD and nitrogen that, at the time of order adoption, were assumed to be effectively protective of groundwater. While preparing my comments to the tentative revised WDRs for City of Modesto's huge LAA next to the San Joaquin River, I was surprised and disappointed to discover the casual oversight by both NPDES *and* WDR staff of the City's sludge drying beds adjacent to the Tuolumne River. The tentative permit exhibits this same casual approach over the City's sludge discharges. It is hard to excuse staff (and management) for failing to adequately address the issue of the pond discharge and kick the can down the road for another permit cycle. As required by the current permit, the City's consulting engineers have already summarized these impacts (how shiny does the silver platter have to be?). I encourage you to enlist WDR staff, and especially the WDR Program Manager, to review the land discharge components of future NPDES permit renewals.

I look forward to reviewing future tentative NPDES permit renewals with land discharge components.

Thank you for your time and consideration.



JO ANNE KIPPS

Influent and Effluent Flow during full or partial effluent flow to D-002

	Flow, MGD			Pond Discharge	
Sample Date	Influent	Effluent	Inf - Eff	Full	Partial
1/6/21	6.24	2.99	3.25		X
1/7/21	6.19	n/a		X	
1/8/21	6.06	n/a		X	
1/9/21	6.02	n/a		X	
1/10/21	6.06	n/a		X	
1/11/21	6.07	n/a		X	
1/12/21	6.04	3.14	2.9		X
1/14/21	6.02	2.5	3.52		X
1/15/21	5.96	4.1	1.86		X
1/21/21	6.04	4.66	1.38		X
1/26/21	6.25	5.22	1.03		X
1/27/21	7.19	4.79	2.4		X
5/10/21	5.97	5.21	0.76		X
5/11/21	5.9	3.5	2.4		X
5/14/21	6.01	4.4	1.61		X
5/18/21	5.99	2.32	3.67		X
5/19/21	6.1	3.39	2.71		X
5/21/21	6.05	3.85	2.2		X
5/22/21	5.94	n/a		X	
5/23/21	5.94	2.81	3.13		X
5/26/21	5.98	4.88	1.1		X
5/30/21	5.45	3.46	1.99		X
5/31/21	5.7	3.32	2.38		X
6/15/21	5.76	4.78	0.98		X
6/20/21	5.51	3.12	2.39		X
6/21/21	5.8	3.51	2.29		X
6/22/21	5.89	1.62	4.27		X
6/23/21	5.84	n/a		X	
7/3/21	5.49	1.95	3.54		X
7/4/21	5.19	2.89	2.3		X
7/8/21	5.81	4.52	1.29		X
7/9/21	5.71	0.31	5.4		X
7/10/21	5.47	n/a		X	
7/11/21	5.51	n/a		X	
7/12/21	5.82	3.56	2.26		X
7/14/21	5.88	4.57	1.31		X
7/15/21	5.86	5.06	0.8		X
7/18/21	5.57	4.08	1.49		X
7/19/21	5.83	1.65	4.18		X
7/20/21	5.84	2.67	3.17		X

	Flow, MGD			Pond Discharge	
Sample Date	Influent	Effluent	Inf - Eff	Full	Partial
7/25/21	5.59	3.68	1.91		X
7/27/21	5.88	3.01	2.87		X
7/28/21	5.88	n/a		X	
7/29/21	5.89	n/a		X	
7/30/21	5.9	n/a		X	
7/31/21	5.71	n/a		X	
8/1/21	5.68	n/a		X	
8/2/21	5.9	3.58	2.32		X
8/3/21	5.88	2.78	3.1		X
8/4/21	5.92	3.63	2.29		X
8/16/21	6.22	4.69	1.53		X
8/18/21	6.26	3.91	2.35		X
8/21/21	6.21	5.74	0.47		X
8/25/21	6.17	3.97	2.2		X
8/26/21	6.17	3.79	2.38		X
9/13/21	6.09	5.7	0.39		X
9/16/21	6.18	3.85	2.33		X
9/23/21	6.21	2.78	3.43		X
9/24/21	5.94	n/a		X	
9/25/21	5.98	n/a		X	
9/26/21	6.08	n/a		X	
11/8/21	6.48	5.58	0.9		X
12/25/21	7.08	2.31	4.77		X
12/26/21	7.39	n/a		X	
12/27/21	7.48	4.44	3.04		X
1/5/22	7.48	7.02	0.46		X
1/6/22	7.03	3.11	3.92		X
1/7/22	6.69	n/a		X	
1/8/22	6.56	1.11	5.45		X
1/9/22	6.38	n/a		X	
1/10/22	6.42	3.46	2.96		X
2/5/22	5.99	0.69	5.3		X
2/6/22	5.97	n/a		X	
2/7/22	6.15	3.97	2.18		X
2/8/22	6.12	5	1.12		X
2/11/22	6.02	5.24	0.78		X
2/18/22	6.05	4.92	1.13		X
2/19/22	5.87	3.62	2.25		X
2/24/22	6.05	5.26	0.79		X